HEALTHY AIR
A COMMUNITY AND BUSINESS LEADERS GUIDE

Reducing Air Pollution from: Paint and Coating Stripping Operations

Could your family be affected?

One company in Minnesota reviewed its paint and coating operations to determine why extra paint stripping was needed. By improving their painting and coating processes, burn-off of racks and reject parts decreased by 20 percent and saved over $17,000 annually.

— Minnesota Technical Assistance Program

The Paint and Coating Manufacturing Sector partners with EPA to assess opportunities for improving environmental performance while reducing regulatory burden.

— U.S. EPA

Why should my paint stripping operation prevent air pollution?

People who are exposed to air toxics at sufficient concentrations, for sufficient durations, may increase their chances of getting cancer or experiencing other serious health effects, such as reproductive problems, birth defects, and aggravated asthma.

Pollution prevention safeguards the health of your employees, customers, and families by using materials, processes, or practices that can reduce or eliminate air pollution at the source. For example, using abrasive blasting with proper particle pollution (dust) controls instead of chemical strippers reduces worker exposure but creates more waste.

Pollution prevention practices may also save money on waste disposal, solvent usage, and the cost of air pollution controls.

You may already be regulated by federal, state, local, and Tribal agencies and may already voluntarily implement pollution prevention practices. These practices can go beyond compliance and further minimize impacts on human health and the environment.

Why should I be concerned about air pollution from my paint and coating stripping operation?

- Solvents in chemical paint strippers can release volatile organic compounds (VOC) and some toxic air pollutants. Chemicals in these substances can also react in the air to form ground-level ozone (smog), which has been linked to a number of respiratory effects.
- Methylene chloride is found in many chemical paint strippers. While federal, state, local, and Tribal regulations limit the amount of emissions from paint and coating stripping operations, dangerous releases of methylene chloride can occur if a paint and coating stripping operation is not in compliance with regulations.
- Lead, chromium and cadmium are metals that may be generated as particle pollution (dust) during abrasive paint removal or mechanical paint stripping. Breathing dust can cause respiratory problems and other harmful health effects.

How can I reduce air pollution from my paint and coating stripping operation?

Evaluate Painting and Coating Processes

- Assess your painting and coating processes to determine what is causing the need to strip and repaint. Improperly cleaned or dried parts, faulty equipment, or improper handling may damage a product and make it necessary to strip and repaint.

Use Chemical Strippers without Methylene Chloride

- Use strippers, such as dibastic ether, that do not contain chemicals that produce toxic air pollutants.
- Use aqueous "hot" strippers.
- Use other solvent "cold" strippers.
- While hot and cold stripping are less toxic than using methylene chloride, use caution when implementing them.

A facility that repaints 30- and 55-gallon drums for reuse switched from using a hot caustic paint remover to using a mechanical paint removal system of metal and nylon brushes. The net savings was $35,000 a year, including $6,000 a year from not needing to purchase sodium hydroxide.

— Solvent Alternatives Guide

Consider Mechanical Methods

- Rub small areas of non-detailed surfaces with a brush made of wire, animal hair, plastic, or synthetic materials that have been impregnated with abrasive grit.
- Protect worker health and safety by using respirators as needed.

Implement Abrasive Stripping Techniques

- Tumbling is a stripping method in which parts are placed in a mixer and tumbled with stones or other abrasive material.
- Plastic medium blasting is a paint and coating stripping method that uses nontoxic plastic media to remove paint and coatings from parts. Plastic blasting media can also be recycled and reused until the particles are too small to be effective.
- Wheat starch can be used for blasting. Wheat starch blasting media are made from renewable agricultural products, which reduces nonrenewable resource consumption.
- Sodium bicarbonate can be used for paint and coating stripping by mixing it with water and shooting the mixture at the part to be stripped. The water controls dust and cools the part being stripped.
- Investigate other abrasive paint stripping methods, including carbon dioxide pellet cryogenic blasting, high-pressure water blasting, and medium-pressure water blasting.
- Protect worker health and safety by using respirators as needed.

Use Heat or Cold to Remove Paint

- Burn-off ovens use high temperatures to burn paint off a surface. Organic paint volatilizes into carbon dioxide and water. Inorganic pigments may need to be scraped off.
- Immerse parts in a molten salt bath. This method also volatilizes organics in coatings into carbon dioxide and water. Inorganic pigments remain on the part and need to be scraped off.
- Use fluidized sand beds. Heated sand or other granulated material vaporizes the organics in the coating and gently removes inorganic residue from the part.
- Flash lamps and lasers are new technologies. Focused light from these two sources is used to heat the coating and decompose it.
- Cryogenic paint stripping freezes the coating until it cracks and can be mechanically removed from the surface.

Control Dust when Using Abrasive Technologies

- Plastic blasting and wheat starch blasting can generate paint chips that may contain metals such as cadmium and lead.
- Plastic media blasting can create dust that is flammable. Ensure that the dust from plastic media blasting does not reach levels where combustion can occur.
- Protect your workers by using respirators as needed.

How do I choose which paint and coating stripping technology to use?

Choosing the appropriate paint and coating removal technology to use requires a consideration of many factors such as the location, size, and composition of the object to be stripped.

The size and location of the object may restrict the type of technology that can be used. For example, racks used in painting and coating operations may be too large to move into a chamber for thermal stripping.

The composition of the object to be stripped may limit the kinds of the stripping technology that can be used as well. For instance, some metals may be susceptible to cracking when plastic medium blasting is used. Wheat starch blasting may be preferable.

What else can I do to reduce air pollution?

Your community may already have groups working for cleaner air. Your expertise and knowledge can be very helpful to these groups.

Many pollution prevention offices offer free on-site assessments for interested businesses. A list of these small business assistance programs can be found at *www.epa.gov/smallbusiness*. This site provides information about assistance and technical help, environmental experts, environmental regulations and laws, funding, and cost-saving opportunities.

Also, sponsor employee awards for good ideas, great efforts, and dedication to pollution prevention. For example, you could provide a cash award for workers who implement cost-saving work practices.

OWNER/OPERATOR INFORMATION SHEET
Paint and Coating Stripping Operations

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An agricultural implement manufacturer in Wisconsin switched from stripping rejected parts in a hot sodium hydroxide bath to using plastic media blasting.

Comparison:

A. Hot Bath Method
Annual amount of hazardous waste generated: 19,000 pounds

Annual cost of hazardous waste disposal: $36,000

B. Plastic Media Blasting Method
Cost of plastic media: $8,000

Capital cost for plastic media blasting unit: $8,000

Annual cost of hazardous waste disposal plastic media:

Net annual savings: $32,000

— Solvent Alternatives Guide

Resources

- National Paint and Coatings Association: *www.paint.org*, (202) 462-6272
- Paints and Coatings Resource Center: *www.paintcenter.org*
- EPA Sector Strategies Program for the Paint and Coating Sector: *www.epa.gov/sectors/paintcoatings/index.html*
- Small Businesses: *www.epa.gov/smallbusiness*
- Community-Based Projects: www.epa.gov/air/toxicair/community.html

Pollution Prevention Techniques
- U.S. EPA Guide to Cleaner Technologies: *www.p2pays.org/ref/02/01048.pdf*
- Reducing waste and hazardous materials: *www.mntap.umn.edu/paint/56-PaintStrip.htm*
- Pacific Northwest Pollution Prevention Research Center: *www.pprc.org/pprc/rpd/fedfund/epa/epastd/evalbead.html*

Stripping Alternatives
- Solvent Alternatives Guide: *www.sage.rti.org*
- Safer stripping and cleaning materials: *www.mntap.umn.edu/paint/55-SaferStripping.htm*

Toxicity of Chemical Paint Strippers
- Paint stripper suppliers and vendors
- Integrated Risk Information System (IRIS): *www.epa.gov/iris*
- Air Toxics Health Effects Notebooks: *www.epa.gov/ttn/atw/hapindex.html*

An aviation company installed a closed, plastic bead-blast paint stripper system to replace chemical stripping using methylene chloride. Installation costs were $18,000, and the payback period based on reduced waste-disposal costs alone was estimated at 3.6 years. Overall, the technology is relatively inexpensive and can easily be transferred to other industries and small companies.

— Pacific Northwest Pollution Prevention Research Center